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pounds, and let the pence take care of themselves; and it is quite futile to diminish the unbiased errors, that is, to increase the precision of our measurements, while a large biased error runs through them all. If we do not know of the existence of biased errors, which in reality pervade our estimates, there is no remedy; if we do know of them, we are likely to obtain more accuracy by the most erroneous corrections for them than by neglecting them; for when we make unbiased corrections for our biased errors, we reduce them to unbiased errors, and then the more terms we include in our average the smaller is our resulting error.

This at first sight is more like an excuse for a free handling of statistics than a rule for attaining accuracy, for it would seem to justify the imposing a new bias upon an old one, thus increasing the error. In financial discussion in the United States the bias has been very marked, and no averages or comparisons, or efforts to correct the bias have been successful in ending doubt.

These examples, and the number could be extended, show that however useful in many directions, and however suggestive in others, the application of mathematics to statistics has proved, we are far from a "science" in the sense of absolute and universal rules. This is not to depreciate Mr. Bowley's volume, for he has performed a difficult task in a manner worthy of all praise. He has gathered the best results of those who have preceded him, and has given us a manual of method which marks the progress of this phase of statistical investigation. From this point of view no one interested in the subject can pass over the work, and its stimulating quality in obliging us to examine anew our principles and processes will advance the position of statistics many stages nearer that of a true science. The many diagrams and tables are interesting in themselves as well as illustrative of text and graphic methods. As a manual of method for testing statistics, and for introducing better arrangement and interpretation, it will be of high value, and may be taken in connection with such works as *Statistics and Sociology*, by Professor Mayo Smith, using the many examples in the latter as exercises in statistical method.

BOSTON.

WORTHINGTON C. FORD.

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*Seventh Annual Abstract of Labour Statistics of the United Kingdom.*  
1899-1900. London. Printed by Darling & Son, 1901.  
8vo, pp. xv + 233.

ONE fact strikingly exhibited by this valuable compilation is the continued and increasing success of co-operative enterprises in Great

Britain, and notably of productive co-operation. For the sixteen years of which account is taken, the membership of workingmen's co-operative societies has shown an uninterrupted annual growth, rising from 1.8 per centum of the population of the United Kingdom in 1883 to 4.1 per centum in 1899. In each year but one the sales have likewise exceeded those of the preceding year—amounting in 1899 to about £75,000,000. Of this sum one tenth represents goods produced by the productive departments of the societies and transferred to their distributive departments. The total amount of goods produced by the workingmen's co-operative societies in 1899 and disposed of through sale or through distribution by the distributive departments was £10,839,822 (an increase of about 6 per centum over the preceding year). To this total the societies established primarily for production contributed £3,375,253. While the co-operative corn-milling societies show a great falling off in membership, and in the amount of their product, although (possibly because ?) their profits have been made much greater, other producing associations show a fifteenfold increase in membership since 1883 and more than a tenfold increase in their sales.

The tables which are significant as to the welfare of the nation have generally a cheerful story to tell. The number of paupers (exclusive of vagrants) relatively to the population of the United Kingdom has fallen off about one eighth since 1883. Deposits in postal savings banks have increased nearly threefold since 1885, and deposits in other savings banks have increased materially. Even in respect to the export trade there seems to be little occasion for the "*Britannia languens*" lament which has so frequently been heard of late. In the period covered by the table (from 1886 to 1900) there are indeed certain years of diminished trade but with the close of the century it was more abundant than ever before. The volume of domestic products per head of population exported in 1899-1900 exceeded that of the first two years by more than 10 per centum.

The volume contains the usual statistical summary of facts relative to trade disputes, industrial accidents, wages in various trades and different neighborhoods, etc.

A. P. WINSTON.

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*The Theory of Stock Speculation.* By ARTHUR CRUMP. New York : S. A. Nelson, 1901. 12mo, pp. 114.

THIS book, which is the third volume in the "Wall Street Library" series, edited by Mr. Nelson, is reprinted, as the editor claims "as